

## CLAIMS

1. A hardware-implemented information processing apparatus comprising:

5 a plurality of processing circuit modules, each performing specific information processing in response to input of information data;

a merging circuit module that merges information data from a plurality of paths into one path; and

10 transmission means for performing one-way transmission of the information data in a data set form to/from the processing circuit modules, to/from the merging circuit module, and between the processing circuit modules and the merging circuit module.

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2. A hardware-implemented information processing apparatus comprising one or more processing circuit modules and zero or one or more merging circuit modules,

wherein the processing circuit modules and the  
20 merging circuit modules perform one-way information transmission of data sets containing certain information to/from the processing circuit modules, the merging circuit modules, or an I/O interface;

wherein each of the processing circuit modules  
25 has a circuit for performing a function specific to the module and has zero or one input and zero or more outputs; and

wherein each of the merging circuit modules has two or more inputs and one output and merges output data sets from two or more circuits into one output.

5           3.       An information processing apparatus comprising:

          a plurality of hardware modules, each configured by implementing one of functional units of certain information processing software as hardware; and

10           transmission means for performing one-way transmission of data between the hardware modules on a data set basis.

          4.       The information processing apparatus according to claim 3 wherein each functional unit of the software corresponds to a software component in which header and data information is communicated and processing is performed by, for example, a function call in C language.

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          5.       The information processing apparatus according to any of claims 1 to 4, the apparatus having an Internet server function.

25           6.       The information processing apparatus according to any of claims 1 to 4, the apparatus by having one of the functions of data mining, natural language

processing, network information processing, a DNA computation simulator, physical simulation, and audio and video processing.

5           7.    A method of manufacturing an information processing apparatus, the method comprising the steps of:

              dividing a software program that implements a certain information processing function on a general-  
10   purpose computer into one or more arbitrary functional units;

              providing a hardware-implemented processing circuit module that has zero or one input and zero or one or more outputs communicating the functional units  
15   via data sets of an arbitrarily fixed or variable length, and operates based on the data sets to perform certain processing corresponding to one of the functional units provided by dividing; and

              providing a hardware-implemented merging circuit  
20   module that has a plurality of inputs and one output and operates to merge inputs of the data sets from the inputs into one output;

              wherein one or more of the processing circuit modules are combined with each other and optionally the  
25   inputs and the output of one or more of the merging circuit modules are further combined therewith so that processing operation implemented by the software

program and the general-purpose computer is implemented by hardware circuits.

8. The method according to claim 7, wherein the  
5 processing circuit module is configured as a gate array.

9. The method according to claim 7, wherein the data set includes a header section and a data section, the header section containing information for the  
10 processing circuit module to control another processing circuit module connected directly or indirectly thereto.

10. The method according to claim 7, wherein the merging circuit module includes a storage device for  
15 temporarily storing the input data sets.

11. The method according to claim 7, wherein the processing circuit module and the merging circuit module include means for feeding back a processing  
20 state of the input data sets.

12. A method of manufacturing an information processing apparatus, the method comprising the steps of:

25 dividing a software program that implements a certain information processing function on a general-purpose computer into one or more functional units;

selecting functional units to be implemented by hardware among the functional units provided by dividing;

providing a plurality of hardware-implemented  
5 processing circuit modules, each having zero or one input and zero or one or more outputs that communicate the functional units via data sets of an arbitrarily fixed or variable length, and operating to perform processing corresponding to one of the selected  
10 functional units; and

providing a hardware-implemented merging circuit module that has a plurality of inputs and one output and operates to merge inputs of the data sets from the inputs into one output;

15 wherein one or more of the processing circuit modules are combined with each other and optionally the merging circuit modules is further combined therewith so that entire processing operation of the software program is implemented by a combination of hardware  
20 circuits and a software part implemented by the general-purpose computer.

13. The method according to claim 12, wherein in the step of combining the processing circuit modules  
25 and optionally the merging circuit module with the software part, the functional units to be replaced in the software program are replaced one by one with the

processing circuit modules or the merging circuit module while being verified for operation.

14. An apparatus comprising a circuit  
5 manufactured with the method according to any of claims  
7 to 13.